DOCUMENT RESUME

ED 026 298 SP 002 122

By-Peck, Robert F.; Bown, Oliver H.
Research and Development Center for Teacher Education.
Pub Date Aug 68
Note-21p.
Journal Cit-Journal of Research and Development in Education; v1 n4 p106-126 Summer 1968 (Georgia Univ., Athens, Coll. of Education)
EDRS Price MF-$0.25 HC Not Available from EDRS.
Descriptors-Behavioral Science Research, Educational Innovation, *Educational Research, *Effective Teaching, Individualized Instruction, Instructional Materials, Instructional Programs, *Program Descriptions, Psychological Needs, *Research and Development Centers, Sequential Programs, Student Teacher Relationship, Teacher Behavior, Teacher Certification, *Teacher Education, Teacher Education Curriculum, Teacher Experience, Teaching Skills
Identifiers-Austin School District, Cross National Study of Coping Style and, FAIR, Fuller Analysis of Interacting Responses, Instructional Modules, Macroteaching, Southwest Educational Development, Texas Education Agency, University of Texas

The first half of this report is a description of the funding, the concepts, the programs, and the evolution since 1955 of the Research and Development Center for Teacher Education in Austin, Texas. The second half is concerned with the program of the center which, in 1968, was reorganized to focus on two areas within the framework of individualizing teacher education: (1) the effects of teacher education on teaching behavior including the effect of this behavior on child learning and (2) the development of a teacher education system composed of "instructional modules" which explain, improve, and objectively measure teaching competency. Guidelines for instruction of teachers developed from research include psychologically sequential studies, early and varied involvement in teaching, a personalized and individualized curriculum, adoption of tested innovation only, a multimedia library of resources, systems of interaction analysis, information on behavioral science, and an effective instructional procedure. Also included are construction steps in teaching procedures for the "instructional modules." Future work includes further research on teacher behavior, instructional modules, and new kinds of teacher educators. An 84-item bibliography is included. (SM)

ED026298

PROFESSIONAL STAFF

William A. Bennie, Professor and Director of Student Teacher
Department of Curriculum and Instruction
Oliver H. Bown, Co-director of the Center, Professor of Educational Psychology
Charles Victor Bunderson, Assistant Professor of Computer Sciences and of Educational Psychology;
Director, Laboratory for Computer-Assisted Instruction
David P. Butts, Associate Professor of Curriculum and Instruction
Ozro Luke Davis, Jr., Associate Professor of Curriculum and Instruction
Harvey Dingman, Associate Professor of Educational Psychology
Edmund T. Emmer, Assistant Professor of Educational Psychology
Frances Fallan Fuller, Associate Professor of Educational Psychology;
Research Scientist, Personality Research Center
June Gallessich, Assistant Professor of Educational Psychology
Glenadine E. Gibb, Professor of Mathematics Education, Department of Mathematics and of
Curriculum and Instruction
Wayne H. Holtzman, Dean, College of Education, Professor of Psychology and Education
Ira Iscoe, Professor of Psychology and Education; Director, Mental Health Training Program
Sara Lundsteen, Associate Professor of Curriculum and Instruction
Clyde I. Martin, Professor of Curriculum and Instruction
Shirley L. Menaker, Assistant Professor of Educational Psychology
Gregg B. Millett, Assistant Professor of Curriculum and Instruction
Robert F. Peck, Co-director of the Center and Professor of Educational Psychology
Robert F. Schenkkan, Professor of Radio-Television-Film; Director, Communication Center
Linda Lee Schmidt, Assistant Professor of Educational Psychology
Walter F. Stenning, Assistant Professor, Department of Educational Psychology
Michael P. Thomas, Jr., Associate Professor of Educational Administration
Donald Veldman, Associate Professor of Educational Psychology
N. H. Wittner, Director, Research and Development, Austin Public Schools;
Coordinator, Austin Public Schools
William G. Wolfe, Professor of Special Education; Director, Special Education
Instructional Materials Center
L. Jean York, Assistant Professor of Curriculum and Instruction

SP002122

RESEARCH AND DEVELOPMENT CENTER FOR TEACHER EDUCATION

Robert F. Peck and Oliver H. Brown
The University of Texas at Austin

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL BY MICROFICHE ONLY HAS BEEN GRANTED BY P. M. Smith TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE U. S. OFFICE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."

The Evolution of the Center

Although the Center was officially established in September, 1965, as a partnership of The University of Texas, the Texas Education Agency and the Austin School District, the kind of work it carries forward began ten years before in a program to experiment with ways of improving both the self-insight and the social insight of young teachers. This work was supported by the Hogg Foundation for Mental Health. In 1958, the NIMH supported this work on an expanded scale, with a grant for a five year demonstration program called Mental Health in Teacher Education.

Several theoretical propositions underlay this work. One was that openness to experience is a trainable characteristic. Drawing on experience with the assessment and training of business executives, the technique of assessment-feedback counseling was introduced. The results of individual personal assessment were used as the point of departure for self-exploratory sessions with student teachers. The assumption was that increased self-knowledge, acquired in a supportive, constructive atmosphere, would induce a persisting tendency to be more alert to one's own actions and their consequences. A corollary premise was that such self-knowledge would lead to firmer, realistic self-assurance and an augmented sense of self-worth.

Experience with this form of feedback demonstrated very quickly its additional value in establishing an emotionally significant, one-to-one relationship between the student and his counselor/instructor, in contrast to the relative anonymity maintained in the conventional program. In addition, it was striking how frequently students were unaware of the relevance of their personal, behavioral and motivational characteristics to the kind of teacher they would become. Increased

TEXAS

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

SP002122

awareness of the inevitability and legitimacy of such influences frequently drew the student into his own professional education in a much deeper, self-motivated way.

Further development of counseling procedures and revision of the curriculum to fit the developmental process which students were found to follow was increased by 1962, resulting in experimentation with 8mm. sound movies as a second kind of feedback data. Students were given the opportunity to see themselves teaching, and to discuss *why* they acted as they did considering both their own natures and the characteristics of the teaching situation.

The ultimate, practical point of these exploratory trials involved a second theoretical assumption: that openness to experience is a generalizing characteristic. Alert, healthily-toned acceptance of the facts of a teacher's own behavior, it was felt, would induce more alert recognition and more sympathetic understanding of his pupils' actions and feelings.

A third set of theoretical propositions was also at issue. It was assumed that the style of the feedback counseling would induce increasing autonomy in the student teacher: more willingness to assume responsibility and initiative, and growing skill and discriminatory judgment in making independent analyses and independent decisions. This was the best way, it seemed, to prepare teachers who would spontaneously encourage just such autonomy of feeling and judgment in their pupils.

It might be noted here that factorial analysis of a complex assessment program turned up, among other things, three dimensions which closely resemble those cited by Gage as primary components of the effective teacher:[1] (1) rational autonomy (his "organized, clear-thinking behavior"). (2) positive interpersonal attitudes ("warmth"), and (3) openness to pupil ideas and actions ("indirectness"). Thus, operational measures were created for each of the major propositions.

While the purpose of the experimental treatments was to increase the teaching effectiveness of students in these three respects, as well as in other ways, there is a very important, central difference between this personalized approach to the improvement of teaching and the approach known as micro-teaching which was being invented at about the same time at Stanford University. Micro-teaching, having identified a number of specific kinds of teaching behavior which are thought to be desirable, then coaches all students in a rather similar fashion to practice each of the desirable teaching tactics, one at a time. Thus, all students are uniformly encouraged to do less lecturing and ask more questions, as a way of permitting and encouraging intellectual initiative on the part of their pupils. The end result, it is hoped, is the development of a reasonably uniform style of teaching which all students will adopt.

In the personalized approach to teacher education developed at Texas, which might be termed "macro-teaching" for contrast, somewhat the same ultimate effects are sought but with a major difference in the method of approach, and with a somewhat different conception of the desired end state. Starting from the observable fact that each student has an idiosyncratic set of motives and his own style of coping with life, the ultimate goal of this training process is not to turn out

[1]Gage, N. L. Can Science Contribute to the Art of Teaching? *Phi Delta Kappan,* XLIX:7, March 1968, pp. 299-403.

teachers who are shaped into one "ideal" behavior pattern, but to help each student develop increasing effectiveness in using his own personal style. For example, a naturally reserved, quiet student would be shown how to evoke active responses from children in ways that are perhaps a little less reserved but nonetheless in keeping with his own behavior style. He would not be shown a dramatic showman of a teacher, and urged to emulate the ebullient, dramatic style of the "born actor."

The personalized approach simply recognizes that different teachers have very different ways of evoking child learning and it encourages each teacher to become increasingly skilled in his own particular way of doing it. Thus, a fourth proposition might be stated, that an idiosyncratic approach to the training of each teacher, tuned to his most pressing concerns and his individual behavior style, is an effective way to help him achieve autonomy, warmth and openness in his dealings with pupils.

There was a good deal of clinical and some experimental evidence to support these propositions; but much more rigorous experimental testing and better measuring procedures were needed. Consequently, in 1962 a controlled experiment was begun, under a U.S.O.E. grant entitled "Personality, Teacher Education and Teaching Behavior." The purpose was to test the effects of the feedback procedures on both the trainability and the transferability of openness in the preservice teacher. Success depended crucially on the cooperation of the teacher education faculty and of the Principal and teachers of Highland Park Elementary School, and on the cooperation of many high school faculty members in the high schools of Austin.

The MHTE project resulted in the development of a diversified battery for assessing the personality characteristics of teachers, and increasingly objective measures of teaching behavior were devised. In 1962, at the same time as the new experimental study was begun, an NIMH grant was obtained for basic research on a new kind of measurement, "Computer Analysis of Personality." To insure synergy, all these operations were combined into a unit known thereafter as the Personality Research Center of The University of Texas.

Meanwhile, since the outset of the MHTE project in 1958, a large number of faculty members of the College of Education had been engaged in revising the curricular content of the pre-service education program. Often, this was done in team planning, by professors from two or three departments.

From the side of Educational Psychology, colleagues changed both the nature and the sequence of topics in the psychological area. From an almost exclusive emphasis in 1957 on test-theory and classical child development, by 1962 the content was changed to an interdisciplinary approach describable as "Behavioral Science Foundations of Education". This course content was both logically and operationally cross-linked with students' experiences in the curriculum courses in classroom participation and student teaching. Moreover, as was later measured systematically, there turned out to be an optimal sequence of topics which began with the students' own most urgent concerns. Only later did they transfer their attention, (and their new knowledge) to issues of child behaviors and the teaching of children.

Major revision and realignment of student learning experiences were initiated in Curriculum and Instruction. Increased emphasis was given to the idiosyncratic needs

of the student and to the particular school situation in which he was placed.

As seems to have been true all over the country, when the entire body of beginning education students at The University of Texas was polled, as early as 1958, their most pressing recommendation was that they be given at least a taste of actual teaching responsibility at the earliest possible point in their training. The faculty involved in the exploratory study believed that this was a sound principle. There is nothing like actual involvement "on the firing line" to capture attention and secure strong ego involvement. Consequently, two alternate strategies were developed for supplying this kind of early experience. At the level of elementary education the program already took students into public classrooms in Austin as "observers." After careful planning with the faculty of the Highland Park School, in 1962, both control and experimental students were given actual teaching responsiblity early in their first education course, in the junior year. This progressed until, by the end of the semester, they were carrying as much teaching responsibility as many people in the conventional program were in their terminal semester of student teaching.

At the secondary school level, it was not possible to put hundreds of junior students into the same high school classes where other hundreds of senior students doing student teaching. Consequently, the first education course at the junior year was turned into a teaching laboratory. The students took turns teaching each other and acting as "pupils." This was an imperfect analogue of actual high school teaching, but it still constituted a genuine teaching experience. There was rich, fast feedback among the students as they took turns teaching one another. Eight millimeter movies were used here, for feedback counseling.

From the start of the MHTE project, another change was made in the way the college students were taught. It was certainly not a total change from earlier practice, but new, systematic emphasis was given to college teaching procedures which minimized lecturing and maximized independent study and student-initiated discussion of issues which immediately concerned them in their practical classroom experiences. For example, there was one device which worked very well as a first exercise for the students in learning to apply psychological and sociological principles to a case study of an individual. The attention of young coeds, especially, was almost magnetically captured when they were given, for their first case study, biographical and personal data on a young, unmarried, engineer who had just finished his college work and was applying for his first job. When asked to do a "blind" analysis, including a discussion of his potentiality as a husband and father, as well as his career potential, both male and female students put in several times the amount of work and thought which they ordinarily gave to an introductory case study of a school child. Thereafter, of course, their assignments did move to studies of child behavior, always with attention directed to such practical questions as, "What would you do about this particular characteristic if you were his teacher?" In short, the college instruction was planned so as to involve students in the very kinds of instructional experiences which they are enjoined to practice with children: relating subject matter and theory to issues which strongly concern the learner, providing for independent analysis of facts which are then checked against empirical evidence, and flexibly-led discussion of issues which have immediate curricular relevance and about

which the students are also strongly concerned. Thus, the college instructors in this program were attempting, even more than usual, to provide living models of the kind of teaching which their students would hopefully do when they went into the school room.

The study which began in 1962 has just been completed. Considering the very limited amount of experimental intervention which was possible amounting, on the average, to about an hour and a half of assessment feedback counseling and a similar amount of video tape feedback counseling, the objective evidence for changes as a result of these experimental treatments is both positive and encouraging. As contrasted with a control group who otherwise received the same kind of instruction, from the same instructors, students who received the feedback in varying combinations showed positive change in openness to experience. The corollary premise was also confirmed that they increased in realistic self-confidence when faced with classroom problems. Secondly, their openness did transfer to their treatment of pupils. They showed a number of signs of more "indirect" teaching practices in video tapes taken at the end of their training. Thirdly, they showed more discriminating judgment and greater autonomy in conceptualizing and resolving school-related problems. Finally, their feelings toward other people, including children, showed increased warmth and positiveness.

Exactly how and why such changes occurred, and how they could be more effectively induced, is the subject for a considerable part of the research in the present R & D Center program.

As a result of such studies, the University of Texas Council on Teacher Education introduced two administrative innovations for all undergraduates pursuing a teaching certificate. For the first time, measures of motivational and personality characteristics were added to the assessment battery required of all teaching candidates. No student is ever excluded from training on the basis of this battery; but the College of Education now provides selective career counseling for students who display problems. Such counseling is offered to all other students, as well, and is now voluntarily sought by at least a third of all candidates.

When the new R & D Center for Teacher Education was founded in 1965, the work just described was one focal interest. Nonetheless, the mission of the new Center was much more broadly conceived. Whereas the earlier work emphasized mainly psychological aspects of teacher preparation, and primarily psychological techniques for inducing change, the national need clearly called for a great deal of attention to the specific, professional knowledge and teaching skills required to meet urgent social and educational demands. For example, the fostering of independent inquiry by children was receiving strong attention as a much-needed change from the passive memorization of facts and ideas. Perhaps the most successful move in this direction was the A.A.A.S.-sponsored development of entirely new curricula and teaching methods, known as "Science: A Process Approach." Consequently, as a natural counterpart to the counseling approach for increasing teacher autonomy, the University Science Education Center added its forces to the R & D program, with its in-service program for training elementary teachers in this new approach for which a Title III grant was secured for its non-research aspects.

Nationally speaking, we also needed to find better ways of educating teachers to individualize their instruction of children.

Therefore, the R & D Center took in a new project, "Individualized Instruction Through Team Teaching," inaugurated at Brentwood Elementary School, with the collaboration of a faculty member of the College of Education. This project planned to convert a conventional school into a partially ungraded school, with team-planning by teachers for the individualization of instruction. The R & D Center supplied two CAI terminals in the school. A member from the Math Education Center, and the College CAI Laboratory began to develop math programs for children on the computer, as a necessary first step to provide a place where *teachers* could learn how to use CAI facilities as part of their instructional program.

This same program for individualizing instruction was then instituted in another elementary school populated almost entirely by Latin-American children from Spanish-speaking families at the lower income levels.

In its first year the new Center took over one other program which was aimed at the unique need for teachers who could work effectively with Spanish-speaking children in the Southwest. This was the Bilingual Education Program accompanied by development of an in-service program of innovation and teacher education in the San Antonio schools.

Because the original plan of the R & D Center included all phases of dissemination as well as research and development, the gradual clarification of national policy into a separation of functions between the R & D Centers and the Regional Educational Laboratories made it essential to see that both functions were carried out, but under the new division of responsibilities which national policy dictated. The possibilities of developing a Regional Educational Laboratory in this part of the United States were explored resulting in the Southwest Educational Development Corporation coming into being within a matter of months as a cooperative endeavor covering the states of Louisiana and Texas.

During the second and third years, Center staff members were involved in two major undertakings. They were carrying out experimental studies which had been planned in the previous years; but they were simultaneously striving to coordinate both the conceptual design and the operation of all Center activities into a genuinely unified master plan.

The individual projects begun in the first two years were moving forward. For example, a new system for describing the *sequential* interactions of teacher and pupils in the classroom was evolved, along with additional new dimensions derived from empiricial analysis of classroom movies. This procedure was turned into a video tape coding system (FAIR: Fuller Analysis of Interacting Responses) which gave equal attention to child behavior and to teacher behavior, in order to permit the analysis of complete sequences of teacher-child interaction in the classroom learning process. A mechanized system was developed and put into operation for coding video tapes and feeding the results directly to computer tape. Rapid computer scoring permits fast feedback to the student teacher about his style of interaction with his pupils. This system also, of course, permits very powerful statistical analyses, of many kinds, to reveal general patterns of interaction that occur with different kinds of pupils or teachers; and it permits comparison of these objectified, quantified measures with many cognitive and emotional characteristics of both teachers and pupils. Such studies are now in progress.

A new experiment in live teaching

experience for junior secondary education students was undertaken. In this study, the prospective teachers have a chance to take responsibility for teaching children early in their training. Their exposure is short but genuine, and it is followed by video tape feedback counseling.

Work continued vigorously on the development and validation of improved assessment procedures, including two new systems for computer analysis of projective data. As an out-growth of an experiment in the second year, plans were laid for the experimental study of child learning gains as a criterion for measuring the effectivenss of personalized teacher education.

A science education program carried out two experimental programs for training undergraduates. It developed and tested several new instruments in an attempt to measure the kinds of gain in initiative and autonomous inquiry at which the teaching approach is aimed, but for which no one anywhere has developed adequate criterion measures. Ten studies were completed, such as one on the effects of the inquiry program on child gains in knowledge and aptitude test scores.

The team teaching program secured a Title III operational grant which was able to take over the equipping and maintaining of the media resource centers in the schools. Studies were completed of team planning phenomena. Other studies were completed on the effects of the over-all experience on children, as contrasted with children in comparable, traditionally organized schools.

The Bilingual program completed studies of the efforts of this program on child learning and prepared its final report.

A self-paced course in educational psychology was launched, with preliminary results indicating a number of desirable effects from this instructional process. A teaching laboratory for secondary students was put into operation, involving approximately 75% of all juniors in this part of the College of Education.

In still another project, a twelve-unit series of movie-based instructional units was developed, to show students the facts of life about working in a school as a formal and informal organization.

On the assessment front, some new concepts and new measuring instruments were adapted from the Cross National Study of Coping Styles and Achievement, which had been proceeding in the allied Personality Research Center from 1965 on. Pilot instruments were developed and tested, to measure both child and teacher styles of coping with problems of task achievement, authority relationships, interpersonal relationships, anxiety and aggression. Plans were formulated for using such instruments in future R & D work, as part of the assessment procedures for evaluating the effect of teacher-training on teacher behavior and on consequent child learning. This assessment approach leads to objective coding of the sequential behavior steps a person takes in reacting to a problem. The codes reproduce most of the idiosyncratic nature of each individual's behavior pattern; and they can be computer processed to perform many kinds of statistical analyses.

While these activities were going on, there was a major, continued press for the unification of the total program of the Center. By April, 1968, a unified conceptual scheme was spelled out which had been implicit in the activities of the Center, but which had not previously been stated in full, clear form. During this same period, the co-directors worked out a new plan of organization for the Center which would both accurately describe and

effectively carry out the new program.

Thus, within a period of about two and a half years, this Center moved from a collection of projects which originated in two colleges and five disciplines (Educational Curriculum and Instruction, Educational Administration, Educational Psychology, Psychology and Anthropology) to a single, coordinated plan of operation. Needless to say, making the plan work in all its parts, and attaining truly successful articulation and integration of all its aspects remains a major undertaking for years to come. Nonetheless, to achieve this much accord on aims and operations among a multidisciplinary team, in a Center which is simultaneously embedded within a university and within a complex public school system, is something of an achievement in itself.

The Program of the Center

The program of the Center has two major aims:

1. Basic research on the effects of varied kinds of teacher education on actual teaching behavior; and research on the subsequent effect of such teaching behavior on relevant aspects of child learning.

2. The development of a teacher education system composed of a diversified array of many relatively small instructional modules. Put together in differing cominbations, such modules can be used in a flexible, often individualized manner for many kinds of teacher education. When any one module is ready for experimental testing, it can be tried out in many collaborating institutions, at both preservice and in-service levels.

Certain guidelines have been determined for this program, representing the fruits of previous research here and elsewhere. These are characteristics which are to be embodied in the total instructional system.

1. Teacher educators should, in a number of specific ways, instruct teachers in the same way that those teachers will eventually instruct their pupils. It has long been observed that people tend to teach in the way they have been taught. If a teacher is to follow the steps of instructional design which are illustrated below, in describing the content of an instructional module, then the teacher educator should do the same, thus giving the teacher firsthand experience in going through the entire process. Similarly, the teacher educator should use all of the instructional procedures which he wants the teacher to use.

2. There is some evidence from our earlier research that there tends to be a typical sequence of concerns in developing teachers, much like a developmental task sequence for growing children. It may be necessary to satisify the early concerns before teachers can devote wholehearted attention to those aspects of teaching which come later in the sequence. Therefore, the teacher preparation program should take account of teachers' most urgent concerns and provide experiences which will aid in their resolution. Units of study thus should follow a psychologically relevant sequence, not necessarily a "logical" sequence, nor one which is uniform for all teachers.

3. Teachers in training should be involved early and often in taking active responsibility for the instruction of pupils. They need to do this in an actively involved way, not as passive observers or mere imitators of order-giving superiors. They need a chance to assess and learn from their own particular way of going at the job; they need personalized feedback,

that is, not just impersonal criticism, aimed at producing compliance with certain generalized rules of "good teaching." Certainly, a blind reliance or exposure to "practical experience" can lead to aimless activity or even to destructive effects. Simulated teaching situations may be more apt or more potent stimuli to learning than the "real thing," in some instances. There seems to be no fully adequate substitute, however, for an early experience of responsible involvement to make students alert and to make them actively *want* to learn teaching skills.

4. Teacher education must be made personally meaningful for the students involved. This may be one way to improve the currently wasteful ratio where two or three "teachers" are trained in teacher education institutions for every one who will eventually teach more than a year or two. From previous work at this Center, it appears that one way of making teacher education meaningful is through personalizing and individually tailoring the training program, rather than subjecting every incoming teacher trainee to the same basic curriculum and thereby failing to interest and retain many who might otherwise continue. In earlier research at this university, we found strong evidence for the proposition that only a humanized, personalized contact of student and instructor is likely to reach the majority of college students, so that they learn anything at all in a lasting manner. Their intrinsic need for a personalized relationship opens or closes their perceptual systems, and greatly facilitates or deadens their learning.[2]

5. The total program for any one student should be individualized so that he can proceed at his own best pace through the system of modules and, within certain limits, by a self-regulated choice of paths. This does not preclude grouping together students who have similar interests and similar learning needs; but it does put the emphasis on individual diagnosis of what each student needs.

6. Any innovations adopted in a teacher education program must include rigorous, planned testing of every procedure, with constant feedback and subsequent modification to insure the continual improvement of the program. For too long, the premises underlying much of teacher education have been unexamined, the results have been inadequate, and the occasional adoption of untested, unvalidated innovations has not begun to meet the needs of our society.

7. In assessing any teacher education program or module, the ultimate criterion is, "what teaching behaviors lead to pupil gain and how can these behaviors be produced?" Thus, the long range objectives of the teacher education program are pupil gain, achieved through the medium of teaching behaviors that result in the various forms of pupil gain for which the schools are responsible.

8. To the maximum degree possible, teachers in training should have an opportunity to use a diversified, multi-media library of resources. This includes books, of course, but also audio-visual materials in the form of videotapes, films, slides, etc. It also includes experience in the actual use of computer-assisted instruction for their own learning, and hopefully in the use of CAI methods with children.

9. Teachers need to be taught concept systems which will aid them in recog-

[2]Peck, Robert F. Student mental health: the range of personality patterns in a college population. In *Personality Factors on the College Campus,* The Hogg Foundation for Mental Health, The University of Texas, 1962, 161-199.

nizing significant patterns in their own teaching behavior, in their response to children, and in the response characteristics of different children. Several systems of classroom interaction analysis are already available for this purpose and the Center provides coding services for use in student instruction.

10. Pre-service teachers need to be exposed to a variety of school situations. Often, it is not possible to do this by personal visits to many different schools. By the use of carefully selected or designed movie excerpts, however, it is possible to show student teachers vivid examples of pupils of different ages, ethnic backgrounds, socio-economic levels, and language groups. It is possible to illustrate some of the similarities and differences in the teaching of various kinds of subject matter. Some of the dramatic differences in teaching behavior between self-contained classrooms and ungraded, team-teaching schools can similarly be illustrated. Undoubtedly, effective use of such simulation materials will not merely consist of exposing students to them passively, but will include very carefully worked out and illustrated methods for involving students in lively, thoughtful discussion of the issues raised by such films.

11. The content of the professional education program must include information on behavioral science principles, and faculty consultation on their application to practical problems in the school setting. Much of this may be achieved through a degree of team teaching at the college level. For example, the discussion of movie excerpts described just above can be simultaneously led by representatives of curricular and behavioral science disciplines.

12. At least some of the instructional modules in the total system will be designed to cause the teacher in training to go through all of the steps of the instructional process. The teacher will systematically design and carry out a teaching process aimed at getting a particular kind of child to achieve certain specified objectives. Such modules show the teacher how various kinds of teaching strategies can be used, and how they can be tested and improved.

Contents of Each Module

In every module in the system, the teacher educator works out the following seven steps of the instructional process, so as to get the teacher to follow the *same* seven steps in designing the learning experience for a child. The construction of every instructional module includes these steps:

1. A statement of the premises, assumptions and rationale for the learning unit.

2. Specification of the behavioral objectives at which the module is aimed, usually in terms of teaching behavior. Such objectives range from the demonstration of a very specific skill in handling a particular process of mathematical instruction, for example, to the diversification of a teacher's repertoire of coping styles for dealing with varied problems, to the development of increased, realistic self-confidence in dealing with a given kind of child.

3. A complete package of the instructional materials to be used in this teacher education module: for example, a problem-posing film clip, a self-instructional computer program, a passage from a book, or other stimulus materials.

4. A very detailed explanation and illustration of how the instruction proceeds. This would be an instructor's guide, so to speak, for the teacher educator. It

would be designed to prevent, as far as humanly possible, a woodenly mechanical application which might pervert the very spirit and purpose of the program. For example, rather than rely solely on the imperfect communication of the written word, a film clip or video tape might show a teacher educator instructing teachers in the intended evocative, flexible, inquiry-inducing manner. This could be followed by a detailed explanation of ways in which the teacher educator could video tape or audio tape himself, and make specific comparions with the illustrative model, as a way of checking the accuracy with which he is carrying out the intended instructional procedure. The array of teaching procedures should include the following:

a. *Modeling procedures*--this includes effective lecturing, if it illustrates an expert-at-work; movies which illustrate an effective technique.

b. *Involvement procedures*--use of on-the-line teaching assignments to get the student deeply involved and concerned; active involvement of students in analytic discussions of a teaching issue posed by a five minute movie.

c. *Individualizing procedures*--programming course materials for self-paced study.

d. *Diagnostic procedures*--directing the instructor's attention to an individual student's point of forward progress, and providing a set of alternative procedures from which a next-step prescription can be drawn.

e. *Personalizing procedures*--study of the student as a person, using various assessment data, video tape performance data, and giving feedback counseling to the student. Both intellectual and emotional factors are considered. The student's unique life-plan is a central issue, including but not limited to career considerations.

5. A detailed description of operations which the teacher educator can perform in order to evaluate the effects of his instructional procedure. This includes both detailed assessment measures appropriate to the behavioral objectives of the module, and instructions for using, adapting or redesigning them.

6. When appropriate, procedures are designed and built into the module for assessing the effects on *children's* learning of teachers who have achieved the behavorial objectives of the teacher education module (or module sequence).

7. Suggestions and illustrations for redesigning the module for teacher education based on a cyclical use of feedback data from the evaluation procedures built into the module.

Different modular sequences will be developed in response to the need for specialized training for teachers in different subject matter concentrations, and for teachers who will work with specialized ages and populations of children. It is anticipated, however, that a great many module sequences will have value for all prospective teachers whose ultimate school assignment is virtually impossible to predict or control. It is also anticipated that a good many modules developed initially for pre-service teachers may have equal value for in-service programs.

In essence, this whole program looks toward the evolution of an ever-growing, diversified "library" of modules. In addition to the inherent flexibility of the modular approach, and the practical utility of having many self-contained instructional "packages" which teacher educators could use in many ways, this program also has the advantage of introducing a rigorously scientific model in the design and execution of every teacher prepara-

tion program. It also places the emphasis on what is learned by the teacher rather than on what the teacher educator does alone.

Moreover, it lays a foundation for measuring specific teacher competencies, in an objective manner. Ultimately, this might make it possible to replace teacher certification by course credits, degrees, and years with certification by measured competencies.

The initial target for the next two years of the Center's work is the evolution of a system of modules for the undergraduate preparation of elementary school teachers.

Several interdisciplinary task forces make up the Curriculum Building Program which is the central, unifying activity of the Center. Each task force includes representatives of the following groups: curriculum and instruction people, to plan training in teaching methods; educational psychologists, to plan training in understanding how and why children learn; public school principals, supervisors and teacher trainers; and three people to represent the three methodological skills of personalization, assessment, and learning technology. Eventually, it is hoped that instructors from Arts and Sciences disciplines can be added to these task forces.

The central program is served by four research and consulting groups (School Input, Personalization, Assessment, Learning Technology) and by three supporting services (Data Processing, Radio/TV, Dissemination). One major task of the Center's Executive Committee is to work out a set of principles, during the next six to twelve months, for deciding what mixture of modules will constitute a satisfactory program for one or another kind of pre-service teacher. This interdisciplinary, inter agency committee, meeting weekly, discusses the several kinds of content and methods suggested by the various task forces. The committee decides the appropriate proportions and timing of various kinds of content and instructional methods in order to make a coherent, integrated system out of the modules which the task forces are building. While it would be entirely possible to have task forces working in isolation from one another, such as one task force in science education and another preparing programs for social studies teaching, it is the consensus of the Center staff that it would be a mistake to have this proceed in mutual isolation, as has usually been the case in the past in teacher education. Certain modules will undoubtedly be developed which will be uniquely appropriate for elementary teachers who will specialize in one or another field of subject matter. Nonetheless, even students who spend their time in such training experiences need to have their total education influenced by the ideas of all groups represented in the task forces. It is a truism that learning any one kind of subject matter involves simultaneous, interacting effects of intellect, motivation and emotion. This is not only true of children, but of the teachers as well. Moreover, with a little appropriate compromise, it may well prove possible to design instructional modules which are appropriate for training teachers in a number of different subject fields. Indeed, one of the unresolved arguments in professional education, which is amenable to empirical testing, is the degree to which certain aspects of the teaching-learning process are generalized across subject matter and conversely, where important differences occur in the nature of the teaching-learning process from one subject to another. Experiments to test out alternate hypotheses can and will be worked out in the

course of developing this instructional system.

Anticipated Products of the R & D Program

Research Output

A product of major importance will be basic research findings about the effects of teacher characteristics and of various teacher education procedures on actual teaching behavior. Of necessity, such findings must be validated in a final step where the teaching behaviors are compared against the effects in child learning: attitudinal and motivational, as well as intellectual learning. Through cooperation with the Computer-Assisted Instruction Laboratory, the basic research foundation for instructional design will be further developed. Methodological advances are also expected in the assessment aspects of the program where good progress has already been made in automating the assessment of personal characteristics so that large numbers of teachers and children can be studied in large scale, systematic research designs.

The Instructional Module Product

A diversified array of multi-media instructional modules will be produced for use in teacher education programs of many kinds. These will be ready for experimental testing and possible adoption in colleges and universities which educate teachers, and in programs of in-service education conducted by school systems and state agencies of education.

A total system of modules will be constructed so as to give balanced attention to all major aspects of teacher growth, to the degree possible in the time period available. In undergraduate training, the timetable might allow two full years of work. An in-service program of teacher education might allow only a few weeks in a year. Systems could be put together from the total "library" of modules for uniform application with all teachers-in-training; but they would not have to be used that way.

The modules could also be used in a much more individualized way. A teacher educator could guide different teachers to different combinations and sequences of learning modules to meet their individual needs. Ultimately, it appears possible to do much of this in a self-paced manner.

New Kinds of Teacher Educators

By active involvement in the research and teaching process, graduate students and post-graduate fellows will be produced who have been systematically trained in the pattern of the educational artist-scientist. Still other teacher educators will learn through participation in cooperative programs jointly carried out by the R & D Center, other colleges, and regional educational laboratories in several parts of the country. Several regional laboratories and numerous colleges which educate teachers have already made plans to collaborate with us. They identify kinds of training modules which are needed, they supply ideas for the design of such modules, and they collaborate in testing pilot forms of modules and module systems. Educators who have worked with these materials will not only be able to put tested instructional procedures into practice in their institutions; they will also be able to do a much more effective job of designing new instructional programs adapted to the needs of their own institutions.

BIBLIOGRAPHY

Books and Book Chapters

Bennie, W. A. *Cooperating for better student teaching.* Minneapolis: Burgess, 1966.

Bennie, W. A. Compensating cooperating teachers. In J. Johnson, & F. Perry (Eds.), *Readings in student teaching.* Dubuque: Wm. C. Brown, 1967, 52-54.

Bennie, W. A. Compensating cooperating teachers. In L. Kraft, & J. Casey (Eds.), *Roles in off-campus student teaching.* Champaign: Stipes, 1967, 106-108.

Bennie, W. A. Student teachers in your classrooms. In L. Kraft, & J. Casey (Eds.), *Roles in off-campus students teaching.* Champaign: Stipes, 1967, 211.

Bessent, E. W., & Harris, B. M. *Inservice education: A guide to better practice.* Englewood Cliffs, N. J.: Prentice Hall, 1968, (in press).

Fuller, Frances F., Pilgrim, Geneva H., & Freeland, Alma M. Intensive individualization of teacher preparation. In *1967 Yearbook of the Association for Student Teaching.* Dubuque: Wm. C. Brown, 1967, 262-328.

Harris, B. M. *A research study of the effects of demonstration teaching upon experienced and inexperienced teachers.* Austin: The University of Texas, 1966

Peck, R. F., & Richek, H. G. Teacher education for mental health: A review of recent studies. In *1967 Yearbook of the Association for Student Teaching.* Dubuque: Wm C. Brown, 1967, 217-325.

Veldman, D. J. *FORTRAN Programming for the Behavioral Sciences,* Holt, Rinehart and Winston, 1967.

Monographs

Ashley, J. & Butts, D. P. *A study of the impact of in-service education program on teaching behavior. Science In-Service Project Report No. 9.* The University of Texas R & D Center for Teacher Education. March, 1968.

Bessent, E. W. (Ed.) *Designs for inservice education.* Austin: The University of Texas, February, 1967.

Bessent, Wailand, Harris, Benjamin, & Thomas, Michael P., Jr. *Adoption and utilization of instructional television.* Austin: Bureau of Laboratory Schools, (in press).

Bohn, C., Butts, D. P. & Raun, C. E. *A study of teacher characteristics as predictors in the successful implementation of an innovative curriculum. Science In-Service Project Report No. 8.* The University of Texas R & D Center for Teacher Education. March, 1968.

Butts, D. P. *The relationship between classroom experience and certain student characteristics. Science In-Service Project Report No. 7.* The University of Texas R & D Center for Teacher Education. March, 1968.

Butts, D. P., Breit, F., & Raun, C. E. *A test of instructional decision making. Science In-Service Project Report No. 11.* The University of Texas R & D Center for Teacher Education. May, 1968.

Butts, D. P., & Raun, C. E. *A study of teacher change. Science In-Service Project Research Report No. 1.* The University of Texas R & D Center for Teacher Education (also accepted for publication in fall issue of *Science Education*). January, 1968.

Butts, D. P., & Raun, C. E. *A study in teacher attitude change. Science In-Service Project Research Report No. 2.* The University of Texas R & D Center for Teacher Education (also accepted for publication in fall issue of *Science Education*). January, 1968.

Butts, D. P., & Raun, C. E. *Does instruction change student behavior in science? Science In-Service Project Research Report No. 5.* The University of Texas R & D Center for Teacher Education. March, 1968.

Butts, D. P., & Raun, C. E. *A study of student attitude and achievement change. Science In-Service Project Report No. 10.* The University of Texas R & D Center for Teacher Education. April, 1968.

Butts, D. P., Steinbach, A., & Raun, C. E. *On behavioral changes in pre-service professional training. Science In-Service Project Report No. 12.* The University of Texas R & D Center for Teacher Education. May, 1968.

Fuller, Frances F., & Bown, O. H. *Look toward tomorrow.* Austin: Hogg Foundation for Mental Health, The University of Texas, 1966.

Fuller, Frances F., Bown, O. H., & Peck, R. F. *Creating climates for growth.* Austin: Hogg Foundation for Mental Health, The University of Texas, 1966.

Lamkin, Bill D., & Veldman, D. J. *Research Methodology Monograph No. 5: Evaluating teaching effectiveness with a situational task.* The University of Texas.

McGlathery, G. E., & Butts, D. P. *Science achievement of young children of contrasting socio-economic background. Science In-Service Project Research Report No. 6.* The University of

Raun, C. E., & Butts, D. P. *The relationship between the strategies of inquiry in science and student cognitive and affective behavioral change. Science In-Service Project Research Report No. 4.* The University of Texas R & D Center for Teacher Education. March, 1968.

Veldman, D. J. *EDSTAT-V basic statistical computer programs for the CDC 6600.* (First Revision). The University of Texas. October, 1967.

Veldman, D. J. *EDSTAT-V subroutine library for the CDC 6600.* (First Revision). The University of Texas. October, 1967.

Veldman, D. J. Menaker, Shirley L., & Williams, D. L., *Research Methodology Monograph No. 4: Manual for scoring the test of Directed Imagination.* The University of Texas. 1967.

Veldman, D. J., & Peck, R. F. *Research Methodology Monograph No. 2: The Pupil Observation Survey--Teacher behavior from the students' viewpoint.* The University of Texas. 1967.

White, M. A., Raun, C. E., & Butts, D. P. *A study of contrasting patterns in in-service education. Science In-Service Project Research Report No. 3.* The University of Texas R & D Center for Teacher Education (Also accepted for publication in fall issues of *Science Education).* January, 1968.

Articles

Bessent, E. W. Inservice education--A point of view. In E. W. Bessent (Ed.), *Designs for Inservice Education.* Austin: The University of Texas, February, 1967, 12-28.

Bown, O. H. New frontiers in teacher education. *Kappa Delta Pi Record,* February, 1967, *3* (3), 98-105.

Bown, O. H., & Fuller, Frances F. Innovations in counseling teachers in Ralph E. Van Atta (Ed.), *Innovations in Counseling,* 1968, 12th Annual Counselors' Conference, The University of Texas at Austin, February 16-17, 1968.

Bown, O. H., Fuller, Frances F., Menaker, Shirley L., & Peck, R. F. Influence of counseling and film feedback on openness to pupil feedback in elementary teachers' filmed behavior. *Proceedings of the 75th Annual Convention of the American Psychological Association.* 1967, pp. 259-360.

Bown, O. H., Fuller, Frances F., & Richek, H. G. A comparison of self-perceptions of prospective elementary and secondary school teachers. *Psychology in the Schools,* January, 1967, *4* (1), 21-24.

Bown, O. H., & Richek, H. G. Mental health of junior college students. *Junior College Journal,* 1966, *37,* 18-21. *Colleges Student Personnel Abstracts,* 1967, *2* (3), 343 (abstract).

Bown, O. H., & Richek, H. G. The Bown Self-Report Inventory (SRI): A quick screening instrument for mental health professionals. *Comprehensive Psychiatry,* February, 1967, *8* (1), 45-52.

Bown, O. H., & Richek, H. G. Phenomenal correlates of Jung's typology: Implications for teacher personality/teacher effectiveness research. The University of Texas, 1966. *Journal of Analytical Psychology* (in press).

Bown, O. H., & Richek, H. G. Influence of extraversion/introversion on prospective teachers' self-perceptions. Paper presented at Southwestern Psychological Association 14th Annual Convention, Houston, April, 1967. *Elementary School Journal.* (in press).

Butts, D. P. The classroom experience model. In E. W. Bessent (Ed.), *Designs for inservice education.* Austin: The University of Texas, February, 1967, 27-38.

Butts, D.P. Widening vistas--inservice education. *Science Education,* March, 1967, 51 (2).

Butts, D. P. The development of the TAB test. *Science Education, 35* (3), March, 1968.

Butts, D. P., & Montague, E. J. Behavioral objectives. *The Science Teacher, 35* (3), March, 1968.

Eaton, E. J. Tools for learning. *TEXAVED Journal,* February, 1967, 12, 13 & 20.

Gibb, E. Glenadine The years ahead, *The Arithmetic Teacher,* May, 1968.

Gregory, Thomas B. Teaching tasks, II: refocusing, *Texas Journal of Secondary Education,* Spring, 1968.

Harris, B. M. Teaching demonstration model. In E. W. Bessent (Ed.), *Designs for inservice education.* Austin: The University of Texas, February, 1967, 41-58.

McGuire, Carson & Fruchter, Benjamin A discrimination model for multivariate Q representations. *Multivariate Behavioral Research,* October, 1967, *2* (4), 507-528.

McIntyre, K. E. The laboratory approach. In E. W. Bessent (Ed.), *Designs for inservice education.* Austin: The University of Texas, February, 1967, 29-40.

Melcer, D. Educating Mexican-American children: A contemporary problem. *Kappa Delta Pi Record,* April, 1967, *3* (4), 165-167.

Millett, Gregg, Kysilka, Marcella, & Morse, Kevin R. Teaching tasks, I: clarity of instructional objectives. *Texas Journal of Secondary Education,* Winter, 1968, (in press).

Peck, R. F. Why should we teach elementary school children about the principles of human behavior? *Journal of School Psychology,* Spring, 1967.

Peck, R. F., & Menaker, Shirley L. Measurement of change in elementary teacher trainees during a two-year training period. *American Psychologist,* 1967, 22, 592.

Thomas, M. P., Jr. Inservice programs as organized learning. In E. W. Bessent (Ed.), *Designs for*

inservice education. Austin: The University of Texas, February, 1967, 59-73.

Veldman, D. J., Computer-based sentence-completion interviews. *Journal of Counseling Psychology,* 1967, *14* (2), 153-157.

Veldman, D. J., Clark, C. M. & Thorpe, J. S. Convergent and divergent thinking abilities of talented adolescents. *Journal of Educational Psychology, 56* (3), 157-163.

Veldman, D. J., & Menaker, S. L. Computer applications in assessment and counseling. *Journal of School Psychology,* 1968, (Spring).

Veldman, D. J., & Otto, H. J. Control structure in public schools and the decision and influence roles of elementary school principals and teachers. *Education Administration Quarterly, 3* (2), 149-161.

Veldman, D. J., Peck, R. F., & Richek, H. G. Personality correlates of the high school experiences of prospective teachers. *The Personnel and Guidance Journal,* 1968, *46* (5), 473-477.

Papers

Ashley, James P. A study of the impact of in-service education program on teaching behavior (Ph. D. dissertation). The University of Texas, August 1967.

Brandt, Dorothy Pauline The development and evaluation of an in-service program in social studies and science for first-grade teachers. (Ph. D. dissertation). The University of Texas, August, 1967.

Breit, F. D. A comparison of the effectiveness of an inservice program and a preservice program in developing certain teacher competencies. (Ph. D. dissertation). The University of Texas, June, 1968.

Butts, D. P., & Raun, C. E. The interaction between curriculum variables and selected classroom student characteristics. The University of Texas, May, 1967.

Castaneda, Alberta M. The differential effectiveness of two first grade mathematics programs for disadvantaged Mexican-American children. (Ph. D. dissertation). The University of Texas, August, 1967.

Fuller, Frances F. Behavioral science foundations for elementary education: course content ordered by empirically derived concerns sequence of prospective teachers. The University of Texas, January, 1967.

Gallessich, June & Schmidt, Linda. School adjustment of first-graders in team-teaching and self-contained classrooms. The University of Texas, March, 1968.

Garrard, Judith. The effects of prospective teachers' social class upon evaluations by lower-class, Mexican-American children. The University of Texas, January, 1967.

Jameson, Gloria R. The development of a phonemic analysis for an oral English proficiency test for

Spanish-speaking school beginners. (Ph. D. dissertation). The University of Texas, 1967.

McGlathery, Glenn E. An assessment of science achievement of pre-school and first-grade children of contrasting socio-economic background. (Ph. D. dissertation). The University of Texas, June, 1967.

McGuire, C. & Rowland, T. The behavioral science foundations of education. The University of Texas, 1967.

Menaker, S. L. Primary and intermediate student teacher differences. The University of Texas, March, 1968.

Morse, Keving R.; Kysilka, Marcella; and Davis, O. L., Jr. Effects of different types of supervision on teacher candidates refocusing behavior. Unpublished research report, April 1968.

Ott, Elizabeth. A study of levels of fluency and proficiency in oral English and Spanish-speaking school beginners. (Ph. D. dissertation). The University of Texas, January, 1967.

Peck, R. F.; Bown, O. H.; Fuller, Frances F; & Menaker, Shirley L. A study of elementary teacher education: Experimental-control group comparisons and changes over a two year training period. The University of Texas, March, 1967.

Peck, R. F.; Bown, O. H.; Fuller, Frances F.; & White, Meda M. Affective interaction: The sequence of filmed teacher pupil behaviors. The University of Texas, February, 1967.

Peck, R. F.; White, Meda; Fuller, Frances F.; & Bown, O. H. Influence of feedback treatments on self-evaluations of elementary and secondary prospective teachers. The University of Texas, May, 1967.

Pena, Albar A. A comparative study of syntactical structures of the oral language status in Spanish and English of disadvantaged first-grade Spanish-speaking children. (Ph. D. dissertation). The University of Texas, August, 1967.

Raun, Chester E. The interaction between curriculum variables and selected classroom student characteristics. (Ph. D. dissertation). The University of Texas, June, 1967.

Steinbach, Alan H. A comparative study of the effect of practice with elementary children or with peers in the science methods course. (Ph. D. dissertation). The University of Texas, August, 1968.

Veldman, D. J. Scoring structure and report generator for the 36-Item OWSC Form. CAP project memorandum, January, 1967.

Veldman, D. J. Influences of sex, verbal ability, and quantitative ability on *One-Word Sentence Completion* Variables. The University of Texas, February, 1968.

Veldman, D. J.; Menaker, S. L. & Peck, R. F. Computer scoring of sentence completion data. The University of Texas, March, 1968.

Veldman, D. J.; Menaker, S. L., & Williams, D. L. The *Directed Imagination* method for projective assessment of teacher candidates. The University of Texas, March, 1968.

Williams, D. L.; Melcer, D. L. & Veldman, D. J. The Bender Gestalt Test and the Wire Figures Test as predictors of reading achievement. The University of Texas, 1968.